DOCUMENT RESUME

ED 405 821 IR 018 261

AUTHOR Hoyt, Brian R.
TITLE The Just in Time Approach To Effectively Use Business Software in College Business Courses.
PUB DATE 96
NOTE 13p.; In: Association of Small Computer Users in Education (ASCUE) Summer Conference Proceedings (29th, North Myrtle Beach, SC, June 9-13, 1996); see IR 018 247.
PUB TYPE Reports - Descriptive (141) -- Speeches/Conference Papers (150)

EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS *Business Administration Education; Computer Software; Critical Thinking; Decision Making; Experiential Learning; Higher Education; *Instructional Effectiveness; Internship Programs; Management Teams; *Problem Solving; Risk Management; *Team Training; Teamwork; Total Quality Management
IDENTIFIERS Continuous Improvement; *Just in Time Systems; *Ohio University; Project Management

ABSTRACT

The skills necessary to compete in a fast paced business environment--critical thinking, risk taking, team building, project management, and others--are not and cannot be addressed in the traditional delivery of an undergraduate business course. The Ohio University-Lancaster Management program uses a project based, just-in-time (JIT) approach to learning, introducing new concepts as they arise in the course of solving real business problems. The program intends to more effectively serve the entrepreneurial business community, business education's important external customers, with more effectively and correctly prepared business practitioners who will make sound contributions to the business from their first day on the job. The Ohio University-Lancaster Team Internship program has five foundation principles: (1) project based curriculum; (2) multiple iterations at varying and increasing levels of experience; (3) handles larger numbers of students in program; (4) program is driven by continuous improvement quality skills and strategy; and (5) introduces business software during project applications through JIT pull system. The classes in the program are team problem solving based, actual business project driven, hands-on learning environments where students are exposed to and required to exhibit certain skills, attitudes, and knowledge areas. A business software tool is presented only when a student or team is ready to apply it in a problem solving situation or for project activities. The paper also compares benefits and accomplishments of JIT versus the more traditional JIC (just in case) approach, similarities between production systems and education systems, and potential accomplishments of JIT approach in business education. (SWC)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

The Just in Time Approach to Effectively Use Business Software in College Business Courses

U.S. DEPARTMENT OF EDUCATION
Office of Educational Research and Improvement
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

- ☐ This document has been reproduced as received from the person or organization originating it.
- ☐ Minor changes have been made to improve reproduction quality.
- Points of view or opinions stated in this document do not necessarily represent official OERI position or policy.

Brian R. Hoyt
Business Management
Ohio University-Lancaster
1570 Granville Pike, Lancaster, Ohio 43130
614-654--6711 ext. 252
hoyt@oak.cats.ohiou.edu

"PERMISSION TO REPRODUCE THIS MATERIAL HAS BEEN GRANTED BY

C.P. Singer

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)"

ED 405 821

...It is Deja Vu all over again!!". I don't think the great Hall of Fame Yankee catcher and baseball manager Yogi Berra had production inventory systems or business software in mind when he uttered the famous line but I have had the deja vu experience while struggling with difficulty of integrating business software into college business courses the last several years.

The images of my struggles in implementing the integration of new materials management system (JIT) into a production plant in New England in the early 1980's repeatedly flashed before my eyes. As a Division Plant Manager I was charged with untenable task of implementing a new concept in inventory management - a Just in Time system, JIT. Just in Time inventory systems totally revolutionized Japanese and then U.S. manufacturing companies like perhaps no other single intervention in recent business history. The late 1970's and early 1980's were a difficult time to be over hauling any part of your production process, especially a part that was attached to so much research and experience. Many organizations found themselves in the difficult position of intense competitive pressures (domestic and international), market shifts, and economic pressures and were not well positioned to reevaluate or change the way they did business just because some people were talking about a new Japanese inventory system. I don't think, as a young manager, I would have been ready to accept a conceptual change in how I ran my plant except I had a business mentor who was also a materials control expert and true visionary. He conceptualized the JIT system's principles and benefits years before there was information in journals and several years later patented an inventory information system that brought customers and suppliers into the information loop (call InvenSurance). That system was again years ahead of the accepted EDI (Electronic Data Interchange) models of inventory and scheduling information sharing.

The exposure to this "inventory prophet" had two significant benefits. The first was in visualizing paradigm shifts. He had the ability to envision production systems not yet in operation but if could be implemented differently would change how manufacturing processes would operate forever. The second benefit was more specific to the inherent problems in the then present materials control systems (in 1970's). I was exposed to the identification of failure causes and how those systems actually prevented businesses from responding to the intense competitive pressures many were then facing. The old inventory principles of Just in Case highlighting long production runs, stockpiled inventories, keep machinery running and avoid interruptions at all costs was ripe with incorrect assumptions and poor performance. What began as a post war production system that was need to meet enormous demand for product turned into habit later. With the cushion of prosperity all but gone this habit impeded competitive actions, the plants could not respond to new competition or new competitors.

IR018361

BEST COPY AVAILABLE

It was only a short while ago that I saw those images, information, and subsequent action flash before me one more time, the "deja vu principle". I was experiencing first hand the same incorrect assumption and poor performance by the system of educating college business students. The assumptions were similar, the levels of poor performance almost exact, and the consequences a mirror image. The market conditions for education are changing, our ability to determine and respond to customer needs is low, our competitive leaders for tomorrow. It is because of the strong parallels in these scenarios that I am proposing similar solutions. Replace the present Just in Case preparation of college business students to a Just in Time system. Replace an aging system of education students based on a Just in Case strategy, riddled with slow response time to customers needs (business community and students) and out of control reworking of information to students. A Just in Time strategy will require students to learn and improve within a dynamic environment and best prepare for the needed impact they must make upon organizations upon graduation. A summary of the two parallel inventory systems are outline in exhibit 1 and exhibit 2.

Exhibit 1

Benefits of JIT/Accomplishments of JIT

1. Faster conversion of materials

2. less Work in Progress (WIP)
   -inventory is less, carrying cost is less, damage is less

3. reduced space and handling
   -overhead reduction, damage is less,

4. quick response to problems
   -find gaps in specifications before end of line

5. less tracking and scheduling
   -no outdating of inventory, no lost items

6. more responsibility

7. better quality
   -find waste before add value, don't ship rejected material, no need for final inspection

8. reduced scrap and rework

9. better market response/increase in market share
   -mixed model capability, more options available

10. employee pride increased

Exhibit 2

Accomplishments of JIC (Just in Case)

1. final inspection is requirement
2. bottlenecks at many operations
3. rework is out of control
4. cycle time of process is lengthened
5. high Work in Progress (WIP), raw, and finished goods inventory
6. very little interaction between employees/departments
7. no in process problem solving
8. slow response to customer needs
9. enormous tracking, data collection, and analysis needed
10. long set up times
11. poor morale, lack of responsibility and accountability

The Similarities - Production systems and Education systems

The typical effect of JIT practices on the quality of a system is in 3 major areas. The practice of reducing inventory improves the quality of a system by exposing quality problems through parts starvation. The surfacing of problems is an opportunity to improve flows through the system. The JIT practice of reduced lot size improves process feedback and reduces the potential of defective pieces. This practice also requires an emphasis on reducing set up times. Pull system support practices like synchronization or line stop capability forces attention to the solution of the process problem preventing future line stoppages.

These JIT practices relate to our education environment in several ways. Reducing inventory would be like reducing the busy work assignments, memorization, text book quizzes that may mask the problems underneath - students who can pass tests, finish all work assignments and papers but can't solve problems, think critically, work in successful high performance teams, or use business software to facilitate project planning and management, analysis, reporting or presentation of information. A cleared system that focuses on the business problem will expose the more dynamic needs of solving current business problems including new skills, attitudes and knowledge. Smaller lot sizes are comparable to project teams working on actual business problems and when there is an exposed area that students are not adequately trained to handle we must immediately correct by providing the necessary help. We then can go back to the preparation classes and include the new learning

objective, skill, or knowledge area. The line stop capability allows students to stop a project if the quality of work does not meet agreed upon expectations. Students don't need to wait until the end of a semester to get feedback or correct their work. Students now have the criteria to stop the learning experience, correct the blockage, and then move on to project completion. A summary outline of the education system as both a Just in Case system and a Just in Time system is displayed on exhibit 3 and 4.

Exhibit 3

Parallels of JIC and Business Education

1. final inspection
   -business do not "trust" degrees or institutions, increased screening of applicants in areas covered or not covered in business education process, "retraining" of many graduates within 1-3 year time period in areas other than product specifications

2. Bottlenecks
   -students continue to be slowed up in certain areas (math, finance, accounting, presentation classes, computer classes)

3. Rework
   -companies "send" employees to training sessions to relearn business principles or application areas of business concepts
   -employees go back to school (2 year to 4 year, or 4 year to MBA) to catch up to those with application experience, or gain an additional degree to safeguard against downsizing, etc.

4. cycle time is lengthened
   -taking longer to get through programs, especially of students working any type of job -2, 4, and 6 year model are still the norm after so many years

5. High WIP and Finished goods inventories
   -many students in program with no clear knowledge of where they are relative to business skills, application of key business concepts
   -as "finished goods" students wait an increasing amount of time after graduation for jobs that are desirable, or that they specifically majored in during college

6. little interaction between departments/employees
   -low skill level in team building
   -little experience in successful high performance teams
   -limited interaction between business functional areas/majors (accounting and marketing, etc.)

7. no in-process problem solving
   -students and faculty do not engage in actual problem solving activities to change their present process of learning while they under go the process together

Exhibit 3 continued

8. slow response to customer need
-lag time between what skill, knowledge, and attitudes that business desires and what education can provide
-students graduate and find needed expertise areas or skill areas in workplace do not match up with emphasis areas in education experience(including application skills vs. theory)
prediction of "hot majors" is topic of surveys (although very few new products are based on surveys 5-7 years old!)

9. tracking

10. long set up times
-no incentive to improve set up times
-prep time for faculty drives new courses or implementation
-major detail and time to obtain approval of program change through curriculum review

11. poor morale
-students do not love to come to class, passion for business lost in experience

Exhibit 4

Potential Accomplishments of JIT Approach in Business Education

1. Faster conversion of materials (students or student teams)
-will be able to move students through management principles and application in less time. If retention is higher in experiential learning projects then less overlap in subsequent classes is needed as well as more continuity between classes.

2. Less Work in Process
-project require that professors and teams not work on outdated or lower priority information or application areas. Stockpiling information is eliminated.

3. Quick response to problems
-the successful completion of an actual business project establishes the quality specifications and performance goals.
-skill, knowledge, or attitude gap must be addressed immediately to complete project
-there is no hoping to catch up later in semester, by finals, or even in another class

4. Better quality
-If the assessment of learning is now successfully exhibiting the application of business knowledge then a student, professor , and a potential employer can have confidence that the student can duplicate that performance in the workplace now!
-to the customer (business community) it is "right the first time"

Exhibit 4 continued.

5. Reduced scrap or rework
   -Although a project may indicate that we need to rework (go over material, software, etc.) it is done much earlier in the process, less value (time, resources) has been added

6. Better market response
   -The projects are actual business opportunities or problems so they can be as dynamic as the workplace
   -when skill or knowledge areas shift then the type of project will change
   -change the parts (skills) and routing (sequence) and introduce those skills or knowledge areas only when the student team pulls them into the project.

7. Employee pride
   -students will express pride as confidence because they know that they can exhibit the type of skills, knowledge and attitudes that business requires
   -direct application of business principles will build a cycle of success
   -successful team participation supports self esteem

A Story

Let's consider that knowledge, skills, and attitudes are the parts that go into the product represented by students or student teams. The product serves the business community needs. Learning by exhibiting skills, knowledge, and attitudes is the process. Classes are stations, professors are floor supervisors, and projects are custom orders that drive the scheduled plant/university. The JIT application is the exact intervention of teaching /learning opportunity just when student (product) needs the inventory item (skills, knowledge, attitudes).

To demonstrate this application let's account for a typical scenario between business and education. Recently an advisory board finished a brainstorming and focus group activity that was intended to highlight particular gaps in college graduates skill areas upon completion of their education. One of the business activities that the business representatives believed would sharpen up several key skill areas was the completion and presentation of an actual market survey. They believed that if students could effectively design, complete, tabulate, analyze, report, and present a market survey that they would have successfully exhibited critical thinking, problem solving ,team work, usage of business software to plan, analyze and present findings. These skills were often mentioned as important skills to demonstrate in the workplace. The education representatives indicated that they "cover" market surveys somewhere in their marketing classes but would be willing to attempt to address the business representatives ideas and suggestions. One business professor would be using a JIT approach and the other the more traditional approach (JIC) to introduce new content and skill areas.

The JIT program starts by generating a Bill of Materials (list of skills, knowledge, attitudes) needed to complete the new order (market survey project). A Routing sheet is then produced to indicate the sequence of activities and parts (skills) need to complete order.

Bill of Materials

1. research skills
2. flexibility attitude
3. interview skills
4. team building skills
5. usage of project management, Excel, SPSS, Power Point
6. facilitation and presentation skills
7. knowledge of team dynamics
8. passion to succeed as high performance team

Routing sheet

1. interview client
2. identify research objectives
3. draft research proposal
4. design survey instrument
5. determine sample size
6. collect data
7. code survey
8. enter data
9. computer tabulation
10. data analysis
11. draft report
12. present findings

Some of the parts (skills) are pre - assembled. Other project driven stations (courses) assembled these skills (i.e. team building, interview skills, flexible attitude, project planning, etc.). As the product (project) moves through the process parts are only introduced as they are needed. Perhaps the most critical part (skill) to pull into the system is business software. When the team has collected all the survey data and are ready to code the survey then we can introduce SPSS statistical software. Their need for an enabling tool actually pulls (a need will motivate team to initiate search to pull software into process) the software tool into the process. At that point the team will stop and address any problems associated with new software and the supervisor (Professor) will facilitate any resources needed to integrate this statistical package. The resources might include a hands on demonstration, custom video training tape, or other tutorials. The team moves on to the next routing step until completion of process or until another intervention is needed.

In contrast, the more traditional program (using the JIC principles) would break down the market survey activities into knowledge areas. Those knowledge areas would be covered over a 1 to 2 year course of time and perhaps never actually producing a survey, analysis or presentation at all. An internship (final inspection) might also be developed to address the business community needs. These responses would require significant set up time (course development, curriculum review, instruction methods review, textbook review, marketing, and scheduling) and "need" long runs (commitments of a 2 year guarantee for course to make, include in market research emphasis or major) to justify the up front efforts. This unresponsiveness to the business community is not intentional but can not be avoided. In addition, employers will have to "rework" those students to give them specific skills in combination with their knowledge needed to contribute in the workplace.

In 6-9 months when the business community expresses a desire to have students exhibit different skills or other activities like continuous improvement problem solving, activity based costing, or international trade their will be only one system that could handle those requests. The JIT pull system is designed for mixed models and can be flexible to handle the short set up times the business community is now requiring. Students exhibit more confidence (morale booster) because they have actually been successful at many of the workplace activities. The actual retention of skills, knowledge, and attitude areas is higher because of the experiential delivery mode. The advancing of software utilization in the workplace will demand that students not just be familiar with a couple of packages but rather can effectively use several business software applications to plan, analyze, and report during project management.

The Program Development

The Ohio University-Lancaster Management program addresses a fundamental problem in business education today: current programs are not working! Students are not prepared with the correct skills, application experiences, and knowledge to make an expected impact on the companies they enter upon graduation. In some cases, the current skills necessary to compete in a fast paced business environment (critical thinking, risk taking, team building, project management, and others) are not and cannot be addressed in the traditional delivery of business courses.

This shortfall has been identified and recognized by the business community, academic institutions, and business students. A direct response from the business community to this inadequacy of recent graduates' preparedness has been an increased investment in training and has manifested itself to middle managers in diminished competitive edge and downsizing. Students are not satisfied with opportunities after graduation and are not finding acceptable work for extended time periods. Academic institutions have many times addressed this by offering more graduate programs, used to "catch up" students in critical decision making areas and other executive training areas.

The basic activities of all students in the Ohio University-Lancaster Business Management program directed by project based learning. We will increase the iteration of problem solving and market opportunity assessment and focus on the dynamic and changing skills needed to contribute in the workplace. The direct and constant contact of real business problems with actual entrepreneurial organizations require exhibition of lower level skills at first, then advancing to higher level decision making skills. This will better prepare students to identify, assess, and evaluate actual organizational requirements and move specific projects through to successful completion. The culmination of these project experiences will involve a team internship with a local or regional company.

The intended outcomes are very clear: to more effectively serve the entrepreneurial business community, business education's important external customers, with more effectively and correctly prepared business practitioners. These students will contribute with passion and sound business principles to the task of repositioning organizations' competitive positions in respective industries.

The logistics of making this plan a reality requires two significant information delivery mode changes. The first is to put students into a comprehensive and fully integrated business project based curriculum. The second is to change the process that students use to bring in a "parts inventory" of skills, attitudes, and knowledge just in time for them to utilize those "parts" to successfully complete their business projects. A critical "part" that must be introduced into the process is the application of business software. The following sections in this discussion will move from problem description to solution alternatives and finish with a logistical outline that supports the integration of business software into college business courses in an effective Just in Time approach.

Problem Statement

The United States business environment faces a critical crossroads on the well traveled road to competitive edge: in product development, market development, technology, market share and profitability. There are fewer frontiers in which companies can take control and show leadership. The rivalry is increasing across the globe, and one resource has been increasing in its value. This

resource can impact the kind of change to take the U.S. on the high road to continued dominance in some markets, regained prominence in others, and once again be a model for all industrialized and emerging nations.

This key resource is clearly our people , our human resources. The U.S. Department of Labor's 1991 Secretary's Commission on Achieving Necessary Skills (SCANS) recognizes this issue and reported that "the qualities of high performance that today characterize our most competitive companies must become the standard for the vast majority of our companies, large and small, local and global. By high performance, we mean work settings relentlessly committed to excellence, product quality, and customer satisfaction. These goals are pursued by combining technology and people in new ways. Decisions must be made closer to the front lines and draw upon the abilities of workers to think creatively and solve problems. Above all, these goals depend on people -- on managers committed to high performance and to the competence of their workforce and on responsible employees comfortable with technology and complex systems, skilled as members of teams, and with a passion for continuous learning."

The business world's trouble translates into a very clear problem for all undergraduate business programs today...they do not work!

College graduates have little impact on the organizations they enter, especially when we consider that they have years of training and significant dollars invested. Their functional expertise is often limited to just one area (accounting, marketing, finance, etc.) with almost no integration experience within the disciplines. In addition, they are unable to apply their textbook "rules" to the workplace and need major socialization in business principles and the normal corporate culture. The end result is the need to provide actual retraining for those new employees who still show some potential. Others are not deemed "savable" and are let go or are allowed to drift until and organization's financial constraints intensify and searches for non-contributors begins. This scenario is heightened as the organizational dynamics of start-up organizations increase. They require a more broad based expertise in business functional areas and entrepreneurial ventures typically have less time or resources for retraining efforts. Expertise in theoretical knowledge without application skills severely weakens the new graduate's potential.

Our Distinctive Approach

The first area of distinction is the manner in which we have planned to address the "skill gap": re-identify our customer. This perspective or frame of reference is not to be taken lightly. We have determined, then supported with actions that an undergraduate business program has a distinct customer: the business community. Most other schools have designated the business student as their customer. The remaining small percent of schools, who also state the business community is their customer, often are just giving lip service for promotional reasons. The real distinction is in supporting that statement, because if the business community is the customer, then they should determine the specifications, quality levels, service requirements, and "product" development parameters of the product -- the student. If business is not tied to the process, then they are not the customer in practice. With competition in all industries (including education) growing more intense, there has been feverish activity to "re-connect" to our customers. The quality movement in which we are now entrenched is a direct result of customer satisfaction. Again, the real distinction between

the OU-L Team Project Internship and traditional programs is in its application, its focus on real time problem solving on "live" projects and activities. This environment becomes an approach to customer satisfaction (student skills = business needs) that is dynamic and changes as the business environment changes. This is much like the quality area's continuous improvement. Traditional programs are not ignorant to the customer identification dilemma; they choose to ignore it because they must be careful what they aim at. They just might hit it! To allow this new customer to directly participate in program objectives will require diminished autonomy, authority, power base, and perhaps a major shift from their own core competencies...welcome to the world of business.

The second area addresses techniques, methodologies, and deliveries. The traditional classroom format (including more progressive technology usage, collaborative teaching methods, etc.) is not equipped to teach these newly identified skills which businesses require (risk taking, project management, listening, change management, etc.). Current efforts are largely limited to case studies, simulations, and internships. While these help in exposing students to business situations, each has serious flaws. Case studies, by definition, are focused on the past. Simulations tend to be clinical, and participants have nothing to risk while most traditional internships are one dimensional, not integrated, and activities are predetermined -- unlike the workplace. Other efforts to address the problem have focused on updating textbooks. New chapters and even a course has been added to such areas as ethics and environmental issues. Jeffrey P. Sudikoff, founder, chairman and CEO of IDB Communications Group heads a $400 million company headquartered in Culver City, California. He recently noted in *Inc. Magazine* (March, 1994, p.23) that he was asked to teach a class of business students on how to become entrepreneurs. The task was too difficult. His response was clearly critical of traditional classrooms. "The very idea! You cannot teach drive, or initiative, or ingenuity or individuality. You cannot teach in a classroom the lessons learned by starting a company with nothing more than hope and the ability to talk a bank officer into giving you a loan." If not in our classrooms, then how? And where? The answer and solution are in a project based, real time environment. If the application of theories and principles and the newer skills can only be seen, understood, and tested in the workplace, then we had better move the classroom closer to the environment. A comprehensive project based curriculum/program will require the understanding and usage of relevant knowledge and expertise. The real time nature of projects will eliminate the expended time lag between the receipt of theoretical information and its implementation in solving problems. Continued project participation will eliminate the present outcome where students reach the work world rusty in application skills and theoretical knowledge. Quality professionals, in their quest for continuous improvement, require process testing to simulate toughest conditions that their products are likely to encounter. Wow! What a concept for business education as well.

The third area (a hurdle for even those schools desiring change) centers on the environment. As in all fields, the best business students tend to make their own opportunities and may succeed in interacting on a variety of levels with businesses during their college years. However, these are exceptions, and most owe their exposure more to their own creativity than to the educational system. The real challenge is to create a system that prepares graduates with not only the theoretical knowledge necessary to get a job but also the application skills necessary to make a difference when they get there. The system must address two specific areas: how do we put larger numbers of students in real projects with businesses and not interfere with the success of that project, and how do we guarantee that when students are working hand in hand with business in a live learning environment to which they are correctly prepared to contribute. We must prepare them so that they

can learn, practice, and make a positive contribution.

The Program Solution - Ohio University-Lancaster Team Project JIT Approach

The Ohio University-Lancaster Team Internship is a program designed to be a progression that will first expose students to actual business activities in smaller problem solving components. From there, the program will increase students' involvement and repetitions in problem solving and the continuance of developing specific decision making and leadership skills. The final stages of students' experiences will be used to effectively apply their expertise gained through the preparation of experiential team projects. The actual on site team internship is the culmination of very targeted project based learning environment. Each member of the team has been involved in several classes that have been specifically designed to ready the interns to function as a team for our client and to hit the ground running in the problem solving and decision making activities. In many cases students will be familiar with the company and some of its problems/opportunities because they have been working on smaller components in previous project based quality classes. The final project based class is the Team Project Internship and will be a four credit field experience with a designated company.

The OU-L Team Internship has five foundation principles: 1) project based curriculum; 2) multiple iterations at varying and increasing levels of expertise; 3) handles larger numbers of students in program; 4) program is driven by continuous improvement quality skills and strategy; 5) introduces business software during project applications through JIT pull system.

The rationale for project based curriculum and hands on activities has been adequately addressed; the format for these projects will be discussed along with the quality emphasis. The need for multiple iterations of problem solving within a team on an actual project is a practice makes perfect strategy. The dynamics and skills necessary to complete actual business projects needs to be developed to maximize an exciting field experience with a regional company. We are committed to providing our internship companies with student teams who have had a series of successful practice opportunities in making complex business decisions. Spreading the project experience of a 3 to 5 set of courses culminating in a field internship exposes more students to this exciting opportunity and provides needed training. The team internship, although reducing the number of businesses with whom we can work, does provide a more realistic experience and increases the probability for success for all participants. The delivery of these project based classes is within a newly developed and introduced Quality Specialization within the Business Management Technology program.

We designed a curriculum paradigm which identifies a five set course bundle, has student performance objectives, expected excellence outcomes, and an effective assessment plan. The most important aspect of this specialization is that it is five classes that are team problem solving based, actual business project driven, hands on learning environment, where students are exposed to and required to exhibit certain skills, attitudes, and knowledge areas. The vehicle that we use to integrate these skills with the projects is the continuous improvement cycle of problem solving and decision making. We provide training in the use of a full range of quality tools, team facilitation training, and presentation strategies. Again, the last project class will be an experienced team undergoing a field internship with an entrepreneurial company.

Our last foundation principle addresses a significant potential barrier in the workplace as well as in the classroom. We must be able to effectively introduce and use various business software packages. For business students, the problem focuses on two areas. The first area involves the use of computers and business software directly. Typical business curriculum would require a computer class or perhaps two that usually is taken by students months and even years before they enter into their business major classes. This push system is not working; retention and keeping up with the upgrades interferes with both student and faculty as they attempt to keep up with the dynamics of their own business discipline.

The second problem area is in the overall curriculum design. Making decisions on which manufacturer's software to use can be a guessing game at best. Successful production inventory control systems require parts to be delivered only as they are needed using the Just In Time (JIT) system. The successful integration of computer usage and software expertise can emulate the shop floor models. The issue is Pull vs. Push. Pulling the software into the classroom at exactly the time business students need those enablers optimizes the benefits of experiential learning project work and increases the application of various business software. The Pull method of integrating software into business classes is driven by the actual business project. What type of enablers are needed to successfully complete the project is the significant criteria for what should be taught (i.e., spreadsheets, project management, statistical process control, SPSS, flow charting, activity based costing, business simulations, and others). When it is needed is determined by the immediate needs of the student project team. The introduction of the tool (enabling business software) is only presented when a student or team is ready to apply it in a problem solving situation or for project activities. The logistics of introducing the tool may include one or a combination of the following deliveries: training videos, software design demonstrations, customized screen cam-type videos, interdiscipline "consulting" sessions with Marketing and MIS professors, or sessions with business practitioners from project partner organizations. These five foundation principles, we believe, will best prepare internship teams for more dramatic experiences and more effective results.